

THREE NEW NEARCTIC SPECIES OF *HALTICOPTERINA* ERDÖS (HYMENOPTERA: PTEROMALIDAE)

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Abstract.—Five species of *Halticopterina* Erdős, including three that are new, are recognized: *H. triannulata* Erdős and *H. moczari* Erdős from the Palaearctic and *H. tahoensis* NEW SPECIES, *H. altiverticalis* NEW SPECIES, and *H. magnistipes* NEW SPECIES from the Nearctic. A key is given to distinguish the species.

Key Words.—Insecta, Pteromalidae, Miscogasterinae, Halticopterina, Halticoptera, Agromyzidae, Drosophilidae, Ephydriidae, Tephritidae

Halticopterina is placed in the Miscogasterinae (Graham 1969). Peck et al. (1964) remarked that *Halticopterina* might be better placed as a subgenus of *Halticoptera*; however, I believe it should have generic status. Distinctive features common to all the species treated here include: antenna with three anelli, five funicular segments, and clavate club; uniformly small body size (1.4 to 1.8 mm); toruli not projecting above the level of ventral margin of eye. *Halticopterina* and *Halticoptera* can be distinguished from other Miscogasterinae by their pronotal collar rounded anteriorly, two clypeal teeth, postmarginal vein shorter than marginal, and enlargement of maxillary palpi and maxillary stipes in males. *Halticoptera* are known to parasitize Agromyzidae, Drosophilidae, Ephydriidae and Tephritidae. Host data for *Halticopterina* are unknown.

HALTICOPTERINA ERDÖS

Halticopterina Erdős, 1946: 160. Peck et al. 1964: 40, Bouček 1965: 8, Graham 1969: 166–167, Medvedev 1987: 138.

Type Species.—*Halticopterina triannulata* Erdős, by original description.

Color.—Head, thorax, and gaster bright to dark metallic green-black. Funicle light amber to dark brown, club brown to dark brown. Legs lemon-yellow to brown. Wings hyaline, venation amber to near white.

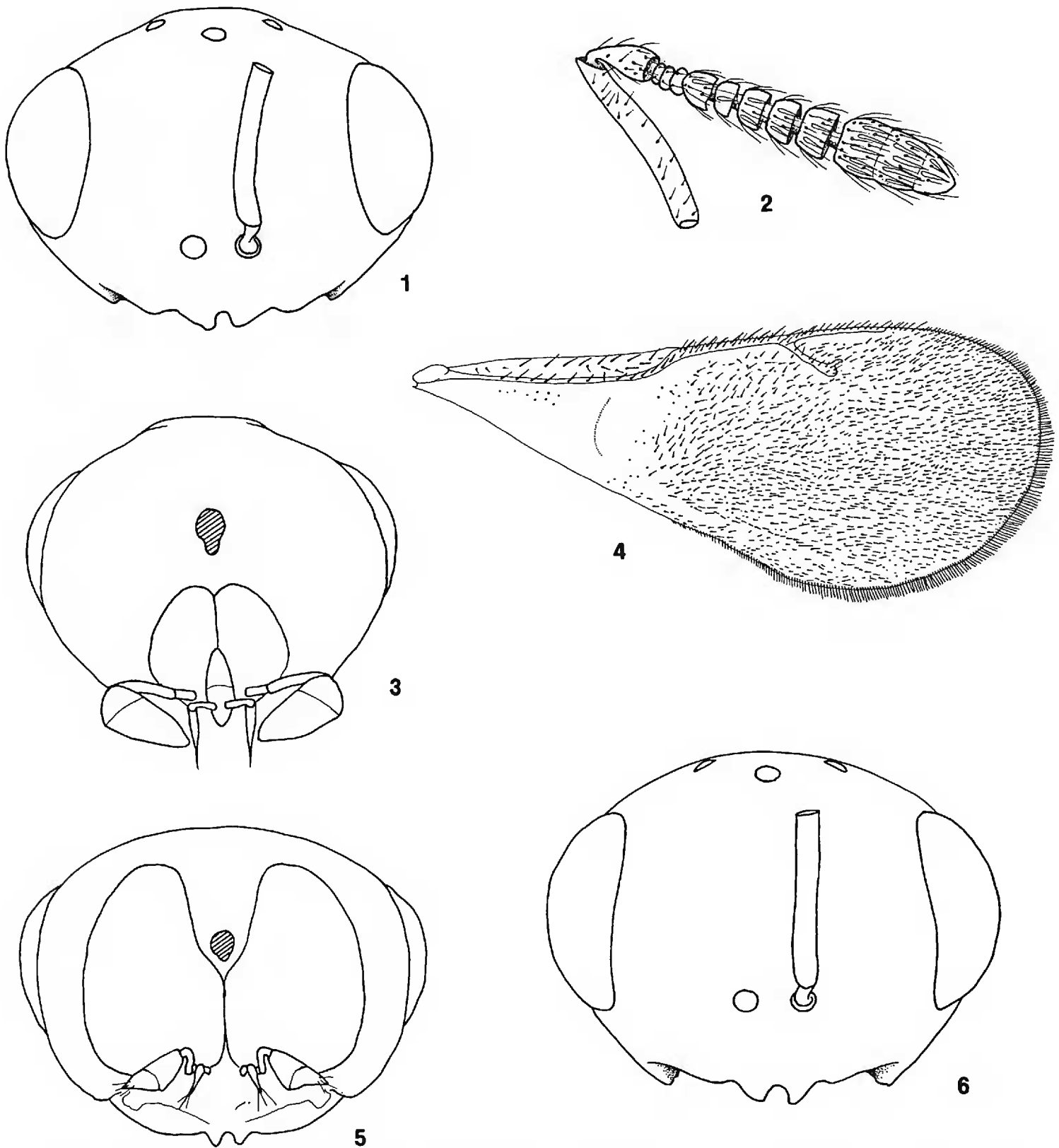
Female.—Length 1.4–1.8 mm. Frontal head width $1.2 \times$ height; POL (distance between posterior ocelli) slightly longer than OOL (distance between posterior ocelli and eye); ocelli very small; temple slightly shorter than one-fifth length of eye; malar space slightly less than two-thirds width of eye; clypeus with anterior margin produced, clypeal teeth with deep medial incision; antennal formula 1:1:3:5:3; torulus at or just below ventral eye margin; antenna clavate, length of flagellum plus pedicel approximately equal to height of head; apex of scape not reaching median ocellus; pedicel length approximately $2.0 \times$ width; all funicular segments slightly wider than long, sensilla in single transverse rows; club width $2.0 \times$ width of first funicular segment. Thorax in profile strongly arched; pronotal collar rounded anteriorly; notauli complete, superficial posteriorly; frenum weakly reticulate; dorsellum of metanotum smooth; propodeum length medially, approximately $2.0 \times$ that of metanotum; median carina complete; plicae not extending to spiracle; propodeum smooth medially; spiracle subround separated from anterior border of propodeum by spiracle width. Gastral petiole length $2.0 \times$ width, devoid of setae, reticulate, with anterior flanges. Forewing length approximately $2.3 \times$ width; marginal vein length $2.2 \times$ stigmal vein length; speculum open below; marginal fringe complete. Gaster length

1.1–2.4 × width; basal tergum length less than 0.5 × total gaster length, hind margin incised medially, except in *H. tahoensis*, gaster slightly concave dorsally; pygostylar bristles subequal.

Male.—Differs from female as follows: Length of malar space almost two-thirds eye width; scape extending to median ocellus; maxillary palpi and stipes enlarged. Gaster triangular in dorsal view, longer than wide. Petiole width 2.0 × length; forewing marginal vein length 2.0 × stigmal vein length.

KEY TO SPECIES OF *HALTICOPTERINA*

- 1 Female (dark body, maxillary palpi and stipes not enlarged) 2
 Male (bright metallic body, maxillary palpi and stipes enlarged) 6
- 2(1) Petiole width 2.0 × length; eye width >2.0 × malar space; vertex strongly elevated (Fig. 8) *altiverticalis* NEW SPECIES
 Petiole length <1.5 × width; eye width <2.0 × malar space; vertex not strongly elevated 3
- 3(2) Petiole subsquare; gaster length 2.4 × width; vertex slightly elevated; hind margin of first gastral tergum entire *tahoensis* NEW SPECIES
 Petiole subrectangular; gaster approximately as long as wide; vertex not elevated; hind margin of first gastral tergum incised 4
- 4(3) Torulus above ventral margin of eye (Fig. 6); club of antenna slightly clavate; forewing length 2.2 × width *magnistipes* NEW SPECIES
 Torulus even to below ventral margin of eye (Fig. 7); club of antenna less clavate; forewing length 2.4 × width 5
- 5(4) Antenna length (flagellum plus pedicel) shorter than height of head, strongly clavate, funicle and club dark brown dorsolaterad, light amber mesoventrad; callus with seven to nine setae *triannulata* Erdős
 Antenna length equal to or slightly longer than height of head, slightly clavate; funicle brown, lightly ventrad, club dark brown; callus with 14–18 setae *moczari* Erdős
- 6(1) Petiole subrectangular, length approximately 1.5 × width 7
 Petiole subsquare, length approaching width 8
- 7(6) Torulus even with ventral margin of eye; vertex slightly elevated; maxillary stipes small, not extending to foramen magnum; gaster length 1.5 × width; basal cell with no or one seta . . . *tahoensis* NEW SPECIES
 Torulus above ventral margin of eye; vertex not elevated; maxillary stipes very large, extending to near vertex of head; gaster width approximating length; basal cell bare *magnistipes* NEW SPECIES
- 8(7) Antenna length approximating height of head, funicle and club light amber, all funicle segments wider than long; third and fourth segments of maxillary palpi longer than height of eye, length of third segment approximately 5.0 × length of fourth; callus with seven to nine setae; apex of scape not extending to median ocellus; torulus below ventral margin of eye *triannulata* Erdős
 Antenna length just exceeding height of head, funicle light amber, club dark brown, funicle segments one and two longer than wide, segments three through five subsquare; maxillary palpi with third and fourth segments subequal in size, slightly shorter than height of eye; callus with 14–18 setae; apex of scape extending to median ocellus; funicle light amber, club dark brown; torulus above ventral margin of eye *moczari* Erdős



Figures 1–6. Figure 1. *Halticopterina tahoensis* NEW SPECIES, female's head, anterior aspect. Figure 2. *H. tahoensis* NEW SPECIES, female's antenna. Figure 3. *H. tahoensis* NEW SPECIES, male's head, posterior aspect. Figure 4. *H. tahoensis* NEW SPECIES, female's forewing. Figure 5. *H. magnistipes* NEW SPECIES, male's head, posterior aspect, showing large maxillary stipes and small maxillary palpi. Figure 6. *H. magnistipes* NEW SPECIES, female's head, anterior aspect.

HALTICOPTERINA TAHOENSIS ANDERSEN, NEW SPECIES
(Figs. 1–4)

Types. — Holotype female. Paratypes: 1 female, 29 males. Data: CALIFORNIA. *PLACER* Co.: Kings Beach, Lake Tahoe, 1903 m, 4 Jul 1987, H. E. Andersen. Depositions: Holotype and 7 male paratypes in U.S. National Museum of Natural History, Washington, D.C.; 1 female and 7 male paratypes in the University of California, Riverside; 5 male paratypes in the Canadian National Collection,

Ottawa, Ontario; 4 male paratypes in the British Museum (Natural History), London; 6 male paratypes retained in the author's collection.

Female.—Length 1.5 mm. Head, thorax, and gaster dark metallic green. Scape metallic green-black with base white; pedicel dark metallic green, amber distad; anelli and funicle dark brown, club dark brown blending to tan distally; ocelli slightly white. Femur metallic brown-black, apex white; tibia brown bases and apices light yellow; tarsi light brown, pretarsus brown-black. Wings hyaline, venation light amber, submarginal, parastigma, and stigma light brown. Head width $1.2 \times$ height. Vertex slightly elevated. Width of head, pronotum, and mesoscutum ratio 30:20:24; POL equal or slightly longer than OOL. Ocelli slightly white. Temples about one-fifth as long as eyes. Malar space shorter than eye width as 6:10. Antennal torulus just below ventral margin of eye, antenna length slightly shorter than height of head; antenna strongly clavate; scape not reaching median ocellus by over two ocellar diameters; pedicel length $> 2.0 \times$ width, slightly longer than combined length of first two funicular segments; funicular segments slightly wider than long, sensilla in single transverse rows, club approximately length of all first four funicular segments, club width twice that of first funicular segment. Thorax in profile strongly arched, dorsal view length (including propodeum) $1.2 \times$ width; mesonotum about two times as broad as long, slightly longer than scutellum; notauli complete, superficial posteriad; frenal groove absent; scutellum, axillae, and lateral lobes of mesoscutum more finely reticulated than mesoscutum mesally, mesoscutal reticulations large; metanotum smooth; propodeum length $> 2.0 \times$ length of metanotum; median carina complete; plicae not reaching spiracle; propodeum smooth medially, spiracle subround, separated from posterior border of metanotum by its width, spiracular sulci shallow, smooth. Gastral petiole length equally as wide, hairs absent, reticulate with anterior flanges, median carina incomplete posteriad, posterior border slightly raised. Forewing length approximately $2.2 \times$ width; basal cell bare, marginal : postmarginal : stigma ratio 16:11:7, marginal vein $2.3 \times$ longer than stigmal vein; speculum open below; marginal fringe complete. Gaster lanceolate, length $2.4 \times$ width, slightly longer than head plus thorax, basal tergum approximately one-third gaster length, hind margin of basal tergite entire, gaster slightly concave dorsally. Pygostylar bristles subequal.

Male.—Length 1.4 mm (1.2–1.6 mm). Head, thorax, and gaster metallic dark green, petiole metallic black; scape lemon-yellow, apex dark brown; basal half of pedicel dark brown, distal half lemon-yellow; anelli lemon-yellow, funicle light brown to brown with club slightly darker; maxillary palpi pale lemon-yellow; coxae concolorous with thorax, forefemur and tibia lemon-yellow, tarsi dark brown; mesofemur amber, tibia light amber to brown, tarsi light brown; metafemur basally dark brown shading to lemon-yellow distad, tibia amber, tarsi dark brown. Gaster brown. Head width $1.3 \times$ height; POL: OOL as 6:5, malar space length $> 2.0 \times$ eye width, as 6:11; funicle segments all wider than long; scape extending to median ocellus; third and fourth segments of maxillary palpi small, their combined length slightly shorter than eye width, maxillary stipes small, not reaching foramen magnum. Frenal groove barely discernable to absent. Gaster, ovate, approximately as long as thorax (including propodeum); hind margin of first gastral tergum entire. Median carina on petiole present only anteriorly or absent. Forewing length $2.2 \times$ width; basal cell with no or one seta, marginal : postmarginal : stigma ratio 15:12:7, marginal length $2.1 \times$ stigma.

Diagnosis.—*Halticopterina tahoensis* can be distinguished by the subsquare petiole, and the gaster length of $2.4 \times$ width. In *H. magnistipes* the gaster length equals the width, and in *H. altiverticalis* the gaster length is $1.9 \times$ width. In *H. tahoensis* the vertex is slightly elevated (Fig. 1), but in *H. altiverticalis* the vertex is strongly elevated (Fig. 8). In *H. tahoensis* the hind margin of the first gastral tergum is entire, but in all the other species it is incised medially. In *H. tahoensis* the basal cell of forewing has no or one seta, but in all the other species the basal cell is bare. The male of *H. tahoensis* has the antenna length longer than the height of the head, and small maxillary stipes (Fig. 3) which do not reach the foramen magnum. In all other *Halticopterina* species the maxillary stipes at least extend to the top of the foramen magnum, and in *H. magnistipes* almost to the vertex of head (Fig. 5).

Distribution.—Known only from Lake Tahoe, Placer County, California.

Biology.—The host is unknown. The type material was collected sweeping the shore of a pond.

Etymology.—Named for Lake Tahoe, the locality where the species was collected.

Material Examined.—Type series only.

HALTICOPTERINA ALTIVERTICALIS ANDERSEN, NEW SPECIES

(Fig. 8)

Types.—Holotype female. Data: OREGON. *LANE Co.*: Frissell Point, H. J. Andrew Experimental Forest, 15 Aug 1984, Schauff and Grissell. Deposition: U.S. National Museum of Natural History, Washington, D.C.

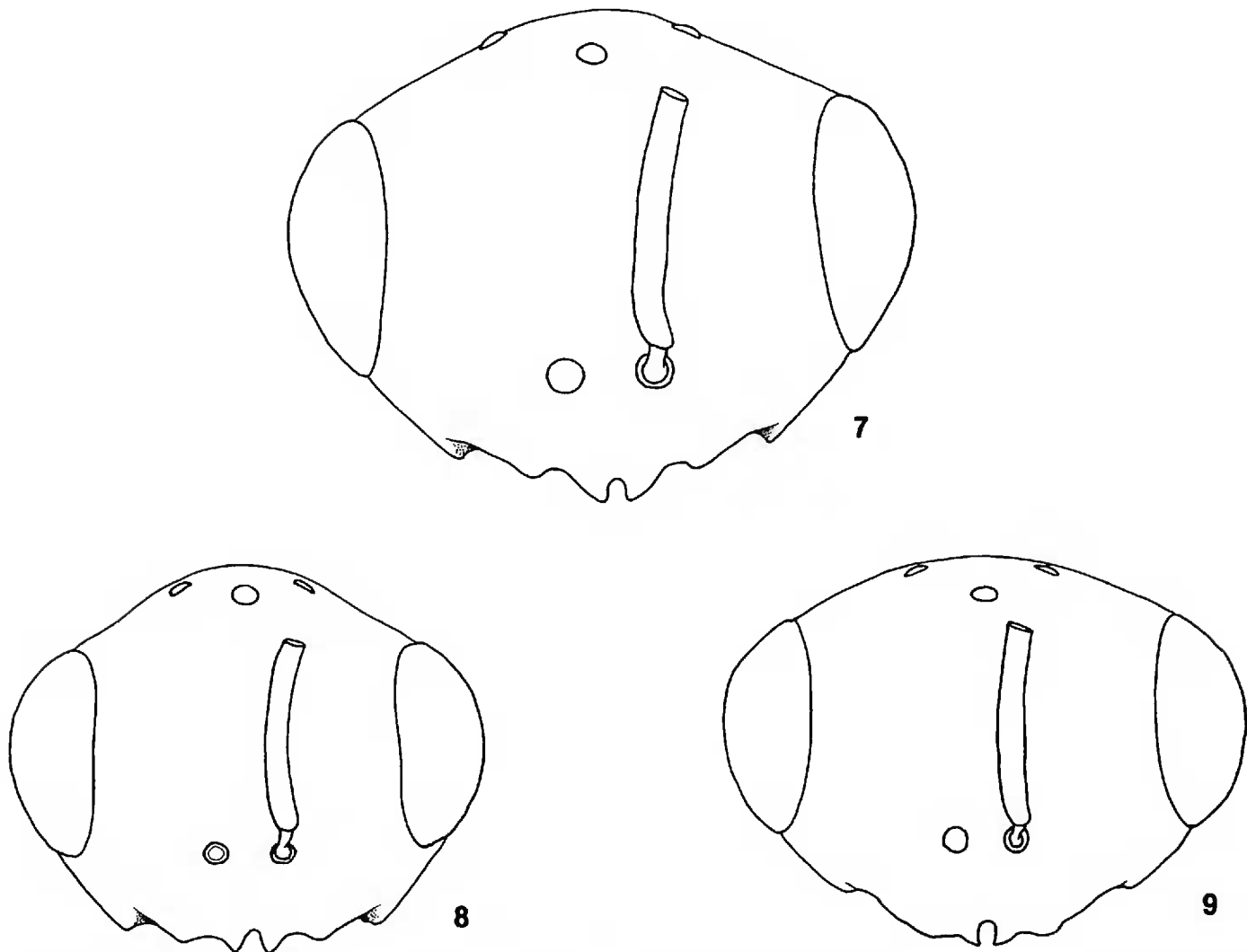
Female.—Length 1.7 mm. Head, thorax bright metallic green, gaster bright metallic green dorsally becoming brown posteriorly and ventrally. Scape basal half yellow white, distal half dark brown with metallic-green reflections, apex yellow white; pedicel, anelli, and funicle dark brown dorsally, tan ventrally; club brown blending to tan distally. Femur metallic brown, base and apex yellow-white; tibiae and tarsi yellow-white, pretarsus brown-black. Wings hyaline, venation white. Head width 1.2 × height, vertex very strongly elevated; width of head, pronotum, and mesoscutum ratio 28:20:24; POL equal or slightly longer than OOL as 6.0:5.5; ocelli slightly white; temples approximately one-fourth eye length, as 2.8:5.0; malar space shorter than eye width, as 4:9. Antenna torulus even with ventral eye margin; antenna length slightly shorter than head height, antenna strongly clavate; scape not reaching median ocellus by over two ocellar diameters; pedicel length > 2.0 × width, approximately length of first two funicular segments; funicular segments slightly wider than long, sensilla in single transverse rows, club approximately length of all first four funicular segments, club width 2.0 × that of first funicular segment. Thorax in profile strongly arched, dorsal view length (including propodeum) 1.2 × width; mesoscutal width 2.2 × length, slightly shorter than scutellum; frenal groove indicated as fine line; frenum weakly reticulated to smooth; scutellum, axillae, and lateral lobes of mesoscutum more finely reticulated than median area of mesoscutum, mesoscutal reticulations large; propodeum medially slightly longer than metanotum; spiracular sulcus shallow and smooth. Gastral petiole width 2.0 × length, median carina incomplete posteriad, posterior border slightly raised. Forewing length approximately 2.2 × width; basal cell bare; marginal: postmarginal: stigma ratio 15:10:6; speculum open below. Gaster lanceolate, 1.9 × longer than wide, slightly longer than head and thorax as 29:27, basal tergum about one-fourth gaster length, its hind margin incised medially, gaster slightly concave dorsally; pygostylar bristles subequal in length.

Male.—Unknown.

Diagnosis.—*Halticopterina altiverticalis* can be distinguished by its transverse petiole which is 2.0 × wider than long; in *H. magnistipes* the petiole is subrectangular, and in all other species it is subsquare. In *H. altiverticalis* the vertex is strongly elevated (Fig. 8), but in *H. tahoensis* the vertex is slightly elevated (Fig. 1), and in all other species the vertex is not elevated. In *H. altiverticalis* the toruli are even with the ventral eye margin (Fig. 7); in *H. triannulata* the toruli are below the ventral eye margin (Fig. 7), and in *H. magnistipes* and *H. moczari* they are above (Fig. 8). In *H. altiverticalis* the eye width is 2.3 × the malar space; in all other species the eye width is less than 2.0 × the malar space. In *H. altiverticalis* the gaster is lanceolate, its length is approximately 2.0 × width; in *H. magnistipes* the gaster length approximately equals its width, and in *H. moczari* the gaster length is approximately 1.4 × its width.

Distribution.—Known only from Frissell Point, Lane County, Oregon.

Biology.—The host is unknown, but the type material was collected from a meadow.



Figures 7–9. Figure 7. *Halticopterina triannulata* Erdős, female's head. Figure 8. *H. altiverticalis* NEW SPECIES, female's head. Figure 9. *H. moczari* Erdős, female's head.

Etymology.—The name is taken from the Latin words *alti*, meaning high, and *verticalis*, meaning the vertex of the head; it refers to the highly arched vertex of the head.

Material Examined.—This species is known only from the type specimen.

HALTICOPTERINA MAGNISTIPES ANDERSEN, NEW SPECIES

(Figs. 5 and 6)

Types.—Holotype female. Paratypes: one female and two males. Data: holotype—PENNSYLVANIA. *DAUPHIN Co.*: Harrisburg, 22 May 1979, A. G. Wheeler, Jr., *Robinia pseudoacacia*; paratypes—same data but 2, 6 and 7 May 1979. Deposition: U.S. National Museum of Natural History, Washington, D.C.

Female.—Length 1.6 mm. Head, thorax, and gaster dark metallic black-green. Scape brown-black with green reflections, base light tan; pedicel brown-black, light amber distad; first two anelli light tan, third anellus light brown, funicle brown, club brown blending to light brown distally. Femur metallic brown-black, base and apex white; tibia brown base and apex yellow-white; tarsi pale yellow, pretarsus light brown. Wings hyaline, venation light amber. Head width $1.2 \times$ height; width of head, pronotum, and mesoscutum ratio 33:23:28; POL longer than OOL as 8.0:6.5; ocelli white; temple about one-sixth as long as eye, as 2:12; malar space shorter than width of eye, as 7:12. Antenna torulus just above ventral margin of eye; antenna strongly clavate, length approximately 0.75 of head height; scape not extending to median ocellus by at least two ocellar diameters; pedicel length $> 2.0 \times$ width, slightly longer than the combined length of the first two funicular segments, all funicular segments

slightly wider than long, sensilla in single transverse rows, club length approximately as long as anelli and first two funicular segments, clava width : first funicular segment width as 6.3. Thorax in profile strongly arched, dorsal view length (including propodeum) $1.4 \times$ width; mesoscutal width approximately $1.8 \times$ length, slightly longer than scutellum; notauli complete, superficial posteriad; frenal groove indicated as fine line; scutellum, axillae, and lateral lobes of mesoscutum more finely reticulate than median area of mesoscutum, mesoscutal reticulations large; metanotum smooth; propodeum length medially, $> 2.0 \times$ as long as metanotum; median carina complete; plicae not extending to spiracle, median area of propodeum smooth, spiracle subround and separated from posterior border of metanotum by its width, spiracular sulcus shallow and smooth anteriorly, rugose posteriorly. Gastral petiole length $< 2.0 \times$ width, devoid of setae, reticulate with anterior flanges, median carina complete, posterior border slightly raised. Forewing length approximately $2.2 \times$ width; basal cell with no or one seta, marginal : postmarginal : stigma ratio 17:12:9; speculum open below; marginal fringe complete. Gaster approximately as long as wide, less than 0.75 length of thorax, basal tergum length approximately one-half of gaster length, its hind margin incised medially, gaster slightly concave dorsally; pygostylar bristles subequal in length.

Male.—Length 1.7 mm. Head, thorax metallic dark green, gaster metallic brown-black, with dark green reflections; petiole metallic black; scape lemon yellow in basal one-half, distal one-half light amber; anelli, pedicel, funicle, and club amber; maxillary palpi dusty lemon-yellow; coxae concolorous with thorax, femora, and tibiae light amber with bases and apices light lemon yellow, tarsi white, pretarsus dark brown. Gaster dark metallic green-black. POL:OOL as 8:7; malar space slightly more than one-half of eye width, as 6.5:11.5; antenna length (pedicel + funicle) slightly shorter than height of head, all funicle segments wider than long; scape not extending to median ocellus; third and fourth segments of maxillary palpi extremely small, their length two-thirds width of eye, maxillary stipes extremely large, almost extending to vertex. Gaster, ovate, width $1.2 \times$ length as 19:17, two-third length of thorax (including propodeum). Petiole length $1.6 \times$ width as 8:5. Forewing length $2.4 \times$ width; basal cell bare, marginal : postmarginal : stigma ratio 17:12:8, marginal length $2.1 \times$ longer than stigmal vein.

Diagnosis.—*Halticopterina magnistipes* can be distinguished by the toruli located slightly above the ventral margin of eyes (Fig. 6). In *H. tahoensis* (Fig. 1), and in *H. altiverticalis* (Fig. 8) they are even, in *H. triannulata* the toruli are below the ventral margin of the eyes (Fig. 7). In *H. magnistipes* the male maxillary palpi are extremely small (Fig. 5); in *H. moczari* and *H. triannulata* they are approximately the height of the eye. In *H. magnistipes* the male maxillary stipes are extremely large, extending to near the vertex of the head (Fig. 5); in *H. tahoensis* the maxillary stipes do not reach the foramen magnum, in *H. moczari* and *H. triannulata* the stipes extend to the top of the foramen magnum. In *H. magnistipes* the vertex is not elevated (Fig. 6); in *H. tahoensis* the vertex is slightly elevated (Fig. 1) and in *H. altiverticalis* the vertex is strongly elevated (Fig. 8). In *H. magnistipes* the petiole length is $1.3 \times$ its width; in *H. altiverticalis* the petiole is approximately $2.0 \times$ wider than long.

Distribution.—Known only from Harrisburg, Dauphin County, Pennsylvania.

Biology.—The host is unknown. Taken on *Robinia pseudoacacia* L.

Etymology.—The name is taken from the Latin word *magnus*, meaning large, and refers to the large maxillary stipes.

Material Examined.—This species is known only from the type specimen.

HALTICOPTERINA MOCZARI ERDÖS

(Fig. 9)

Halticopterina moczari Erdős, 1954: 153–154.

Types.—Holotype male, Data: HUNGARY. Olcsa 10.vii.1953 (Moczari), in Hungarian Museum, Budapest. (Not examined.)

Diagnosis.—*Halticopterina moczari* and *H. triannulata* closely resemble one another in having the petiole longer than wide, and the vertex not strongly elevated (Figs. 7 and 9); the maxillary palpi and maxillary stipes in males are both large, the latter at least reaching to the top of the foramen magnum. *Halticopterina moczari* differs from *H. triannulata* by having the antenna equal to or slightly longer than the height of the head and slightly clavate; the funicle and club are dark brown. The male of *H. moczari* differs from *H. triannulata* by having the third and fourth segments of the maxillary palpi subequal in length and slightly shorter than the height of the eye; its callus has 14–18 setae, its funicle is light amber, and its clava is dark brown.

Biology.—The host is unknown. The holotype male was swept from *Medicago sativa* L.

Material Examined.—Non type material: TURKEY. Erzurum, 12 Sep 1970, 1 female. YUGOSLAVIA. Kosmaje, 16 Sep 1979, 1 female. MOLDAVIAN, S.S.R., Kishnev, 25 May 1960, 1 female. CZECHOSLOVAKIA. Maria, 13 Sep 1951, 1 male.

HALTIAPTERINA TRIANNULATA ERDÖS

(Fig. 7)

Halticopterina triannulata Erdős, 1946: 161–162, male, female.

Halticopterina triannulata: Peck et al., 1964: 40.

Halticopterina triannulata: Bouček, 1965: 8.

Halticopterina triannulata: Graham, 1969: 166–167.

Halticopterina triannulata: Dzhankmen, 1978: 57–228, ex Kothekar (1987) translation in Medvedev (1978).

Types.—Syntypes. Data: HUNGARY. Kiskoros, 8 Jul 1943 (Erdős), in coll. Erdős. (Not examined).

Diagnosis.—*Halticopterina triannulata* and *H. moczari* closely resemble one another in having the petiole longer than wide, and vertex not strongly elevated (Figs. 7 and 9). The maxillary palpi and maxillary stipes in the males are both large, the latter at least reaching to the top of the foramen magnum. *Halticopterina triannulata* differs from *H. moczari* by having the antenna shorter than the height of the head and strongly clavate; the funicle and club are dark brown dorsolaterally, and light amber mesoventrally. The male of *H. triannulata* differs from *H. moczari* by having the third and fourth segments of the maxillary palpi longer than the height of the eye; the callus has only seven to nine setae, and the funicle and club are both light amber.

Biology.—The host is unknown. The Canadian female was swept from *Medicago sativa* L.

Material Examined.—Non type material: BOHEMIA. Praha Sv. Prohop, 7 Jun 1964, 1 female. SLOVAKIA. Kamendin, 17 Aug 1948, 1 male. CANADA. ALBERTA. Scandia, 11 Jul 1956, 1 female.

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